The following is claimed:

52. In an electrical modular power node including a power bus backplane containing a plurality of bus bars at least some of which are connectable to at least one power source, each bus bar having terminals spaced along the bus bar, each terminal being in a predetermined position in a pattern, and a plurality of functional modules, each housing at least one functional component and circuitry having at least one connector for connection to at least one terminal on a bus bar to provide output required by a load,

the improvement characterized by

a. respective ones of the bus bars running in a first direction and being adapted to carry differing phases and/or polarities of power with plural ones of said bars carrying individual phases and/or polarities being connected together by tie bars extending generally traversely to said first direction, with the bus bars and tie bars of respective phases/polarities being generally coplanar and perpendicularly spaced from one another.

53. The electrical modular power node of claim 52 in which connections between functional modules and terminals of the bus bars results in

vertical and lateral support of other modules in facing position relative to the power backplane and other modules.

54. The electrical modular power node of claim 53 in which the functional modules are self-connecting to the backplane, such that when a functional module is properly positioned and oriented relative to the backplane and pressed towards the backplane, the terminals and connectors mechanically self-engage and make electrical contact and the backplane vertically supports the functional module via the connection.

55. The electrical modular power node of claim 52 in which parallel sets of bus bars are provided in the backplane and the functional modules are shaped and sized so that exterior surfaces of the functional modules facingly conform to bounding exterior surfaces of adjacent functional modules.

56. The electrical modular power node of claim 55 having module positions where some terminals on the bus bar are not to be electrically connected to a given functional module are provided which resemble those providing electrical connection and in those positions provide additional mechanical support.

57. The electrical modular power node of claim 55 in which connectors supported on each functional module and selected terminals of the bus bars of the backplane support said functional modules in position

relative to the power backplane and relative to other functional modules.

58. The electrical modular power node of claim 56 in which pin connectors on the functional modules are self-connecting to tulip terminals on the backplane such that when a functional module is properly positioned and oriented relative to the backplane and pressed toward the backplane, the terminals and connectors self-engage making electrical contact.

59. The electrical modular power node of claim 55 in which at least some of bars in the same relative positions of the parallel sets of bus bars are electrically connected together.

60. The electrical modular power node of claim 59 in which at least one set of interconnected bars is connected to a power source.

61. The electrical modular power node of claim 55 in which at least some bus bars in the same relative positions of the parallel sets of bus bars are no electrically connected together and not connected to an external power source but at least one set of bus bars is connectable to an external power source.

62. The electrical modular power node of claim 54 in which at each minimum size functional module position on the backplane there is a terminal for each bus bar in a standard pattern of configuration and orientation whereby connectors in positions opposite selected

terminals engage those terminals contribute to support of the functional module and terminals which are not opposed by connectors are accommodated by the module configuration to permit interconnection of those terminals and connectors which are opposed to one another.

63. The electrical modular power node of claim 54 in which at each minimum size functional module position on the backplane there is a terminal for each bus bar in a standard pattern of configuration and orientation whereby terminals in positions opposite selected connectors self-engage and contribute to support of the functional module and connectors which are not opposed by connectors are accommodated by the module configuration to permit interconnection of those terminals and connectors which are opposed to one another.

64. The electrical modular power node of claim 54 in which those positions opposite terminals which are not to be connected electrically to a functional module are opposed by connectors not electrically connected in the module providing mechanical support.

65. The electrical modular power node of claim 61 in which the terminals on the bus bars of the backplane are spring-loaded gripping elements and the connectors on the functional modules are a simple post, whereby the gripping elements yield to a post but continue to engage that post as the functional module is moved toward the backplane.

66. An electrical modular power node of claim 54 in which the packplane is marked to indicate proper positioning of functional modules of minimum size whereby functional modules placed in the positions indicated but spaced away from the backplane may be moved toward the backplane for self-engaging connection of the connectors to the terminals.

67. An electrical modular power node of claim 55 in which the backplane is marked to indicate proper positioning of functional modules of minimum size whereby functional modules placed in the positions indicated but spaced away from the backplane may be moved towards the backplane for self-engaging connection of the connectors to the terminals.

68. The electrical modular power node of claim 55 in which the backplane is marked to indicate proper positioning of functional modules of minimum size whereby functional modules placed in the positions indicated but spaced away from the backplane may be moved toward the backplane for self-engaging connections of the connectors to the terminals, wherein functional modules have a dimension an integral multiple of the minimum size may also be accommodated by providing at least one set of connectors on the functional module in the pattern orientation corresponding to at least part of one pattern and orientation of terminals on the backplane and

wherein other terminals at other positions on the backplane are accommodated by design of the module.

69. The electrical modular power node of claim 18 in which all positions on the larger than minimum size functional module which correspond to the terminal positions on the backplane are provided with electrical connectors or non-electrical connectors which engage all of the terminals on the backplane opposite the larger module and contribute to its support.

70. The electrical power node of claim 55 in which at least some functional modules are directly electrically interconnected through connections on opposed functional module faces other than those facing the backplane.

71. The electrical power node of claim 60 in which at least some functional modules are directly electrically interconnected through connections on opposed module faces other than those facing the backplane.

72. The electrical power node of claim 21 in which connectors are supported on a sidewall face of a functional module and terminals positioned to mate with the connectors are positioned on an opposed sidewall face of another functional module.

73. The electrical power node of claim 22 in which the respective connectors are self-connecting and in predetermined patterns,

orientation and position on the sidewalls so that when the sidewalls are moved together with the modules in predetermined position the connections self-connect, electrically connecting active electrical connections and their respective circuitry together.

74. The electrical power node of claim 21 in which the respective connectors are supported on opposed faces parallel to the backplane of functional modules enabling the functional modules to be stacked away from the backplane so that an outer module is supported on an inter module at least in part by engagement of their respective electrical terminals and connectors.

75. In a power node control center of modular construction for use in an electrical power distribution system including a power bus backplane having a plurality of parallel and substantially co-planar bus bars for carrying electrical power, a plurality of functional modules contained in a parallelpiped-shaped housings adapted for complementally contracting fitting with other ones of said functional modules and with said backplane, at least some of said functional modules comprising at least one of rectifying means, switching means, voltage conversion means, voltage regulation means, pulse and other wave form generation means, voltage transformation means and/or power sensing and limiting means, a control module contained in a parallelpiped-shaped housing adapted for complementally contacting fitting with at

least one of said functional modules and with said backplane and having programmable microprocessor means for controlling operation of at least one of said functional modules according to preselected instructions and operating and performance criteria including at least one of voltage and current limits, voltage polarity, surge criteria, temperature limits, humidity limits, shock limits and alternating current phase parameters, and plug-compatible means on said backplane and at least one of said functional modules for electrically connecting a selected functional module to said bus bars of said backplane,

the improvement characterized by

a. outer surfaces of said functional and control modules facing away from or perpendicular to said backplane being planar and smooth;

b. said bus bars being grouped in sets, each set embracing at least two bus bars and being adapted to carry power having phase and/or polarity differing from power carried by other sets, said bars of each set being connected together and generally co-planar with one another;

c. said sets being transversely spaced one from another;

d. said plug compatible means including a plurality of spring loaded receptacles connected to respective sets of said bus bars

and being adapted to receive connector pins extending from functional module surfaces facing said backplane.

76. In a power bus backplane including at least two bus conductors running in a first direction and being adapted to carry power of differing phase or polarity, rigid terminals connected to each of the bus connectors and resinous material cast about the bus conductors to support the bus conductors and the rigid terminals;

the improvement characterized by:

a. pluralities of such bus conductors being grouped in a plurality of sets;

b. bus conductors of each set being connected together by ties extending transversely to the first direction, the ties being at least partially embedded within the cast resinous material;

c. bus conductors of each set being laterally spaced from one another in a second direction transversely to the first direction;

d. the sets being transversely spaced one from another in a third direction perpendicular to the first and second direction so that the bus conductors and the ties of respective sets carrying respective individual phases and/or polarities are co-planar and perpendicularly spaced from one another.

77. The bus backplane of claim 76 in which connector pins on a module adapted to fit on the backplane and the receptacles on the backplane

include at least one pair fitting sufficiently snugly to act as a self-engaging connector so that the module and backplane fit together upon being positioned and pressed together.

78. The power bus backplane of claim 77 in which the bus conductors are in a tacked array and terminals for a bus conductor on the bottom pass through a clearance hold in the bus conductor on the top with an insulating gap therebetween.

79. The bus plane of claim 78 in which the bus conductors are repeatedly in a side-by-side orientation resulting in columns of stacked bus conductors with regular columns of terminals for receiving modules at regular intervals along the column.